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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/645,968	08/22/2003	Masaaki Arai	WAM-04501	8390

7590 06/21/2005

Patent Group
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EXAMINER	
DOUGHERTY, THOMAS M	
ART UNIT	PAPER NUMBER
2834	

DATE MAILED: 06/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/645,968	ARAI ET AL.	
	Examiner	Art Unit	
	Thomas M. Dougherty	2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 August 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 August 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

Claims 1, 2, 3 and 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al. (JP 4-35107) in view of Satoshi et al. (JP 2001-110264). Morita et al. show (e.g. fig. 2a, 2b) a crystal unit comprising: a crystal blank having a hole portion defined in at least one principal surface (the bottom surface) thereof, providing a vibrating region in a portion of the crystal blank which is made thinner by the hole portion; excitation electrodes (6) disposed respectively on opposite principal surfaces of the crystal blank in said vibrating region; extension electrodes (connected to 33, 34, 36 and solder point on 21), to respective first and second positions on an outer peripheral portion of said crystal blank; and a casing (20); wherein said crystal blank has a fixed end electrically and mechanically connected to said casing at said first position and extension electrodes [is] is electrically connected to said casing by wire bonding in said second position (see fig. 2b and note wire connection at 36).

Said crystal blank has a free end in said second position.

Said crystal blank comprises an AT-cut quartz crystal blank (see CONSTITUTION) having a substantially rectangular (see fig. 2a) planar shape, said first position is on an end of said AT-cut quartz crystal blank, and said second position is on another end of said AT-cut quartz crystal blank which is opposite to said end of said AT-cut crystal blank.

Morita et al. show (figs. 2a, 2b) a structure for holding a crystal blank having a hole portion defined in at least one principal surface thereof, providing a vibrating region

in a portion of the crystal blank which is made thinner by the hole portion; said crystal blank supporting thereon excitation electrodes (6) disposed respectively on opposite principal surfaces of the crystal blank in said vibrating region, and extension electrodes (connected to 33, 34, 36 and 21) extending respectively from said excitation electrodes 96) to respective first and second positions on an outer peripheral portion of said crystal blank; said crystal blank having a fixed end electrically and mechanically connected to a holder (surface of 21) in said first position; said crystal blank having a free end on which wire bonding wires are connected (plurality of wires is clearly shown in figure 2a) are connected to extension electrodes in said second position.

Said crystal blank comprises an AT-cut quartz crystal blank (again see CONSTITUTION) having a substantially rectangular planar shape.

Said first position is on an end of said AT-cut quartz crystal blank (on 21) and said second position is on another end of said AT-cut quartz crystal blank which is opposite to said end of said AT-cut quartz crystal blank.

Morita et al. don't note eutectic bonding.

Satoshi et al. show (drawing 1) a crystal unit comprising: a crystal blank having a hole portion defined in at least one principal surface (both the top and bottom surface) thereof, providing a vibrating region in a portion of the crystal blank (1) which is made thinner by the hole portion; excitation electrodes (3a, 3b) disposed respectively on opposite principal surfaces of the crystal blank (1) in said vibrating region; extension electrodes (4a, 4b), to respective first and second positions on an outer peripheral portion of said crystal blank (1); and a casing (2a, 2b); wherein said crystal blank (1) has

a fixed end electrically and mechanically connected to said casing by eutectic alloy in said first position (see SOLUTION) and extension electrodes [is] is electrically connected to said casing.

Their eutectic alloy comprises an alloy selected from the group consisting of AuSn, AuGe, and AuSi. See page 3 paragraph 17 of the DETAILED DESCRIPTION.

Satoshi et al. show (drawing 1) a structure for holding a crystal blank having a hole portion defined in at least one principal surface thereof, providing a vibrating region in a portion of the crystal blank which is made thinner by the hole portion; said crystal blank supporting thereon excitation electrodes (3a, 3b) disposed respectively on opposite principal surfaces of the crystal blank in said vibrating region, and extension electrodes (4a, 4b) extending respectively from said excitation electrodes (3a, 3b) to respective first and second positions on an outer peripheral portion of said crystal blank (1); said crystal blank (1) having a fixed end electrically and mechanically connected to a holder (surface of 2b via eutectic alloy solder) in said first position;

Satoshi et al. don't show their second end connected to the casing by wire bonding. They do not show a free end. They don't define a cut for their crystal.

It would have been obvious for one of ordinary skill in the art to employ the eutectic alloy of Satoshi et al. in the device of Morita at the time of that invention in order to achieve a matching of transition point of the alloy and the crystal as Satoshi et al. note in their p. 3 para. 17 description. Additionally, such a laminated design results in improved productivity as Saroshi et al. note in their PROBLEM TO BE SOLVED section.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morita et al. (JP 4-35107) in view of Satoshi et al. (JP 2001-110264) further in view of Nippon (JP 2001-237665). Given the combined invention of Morita et al. and Satoshi et al. neither shows a pillow member mounted on the casein, said free end being placed on said pillow.

Nippon shows (figs. 1-4) show (e.g. fig. 2a, 2b) a crystal unit comprising: a crystal blank providing a vibrating region in a portion of the crystal blank; excitation electrodes (7) disposed respectively on opposite principal surfaces of the crystal blank in said vibrating region; extension electrodes (8), to respective first and second positions on an outer peripheral portion of said crystal blank; and a casing (3, 4); wherein said crystal blank has a fixed end electrically and mechanically connected to said casing at said first position (at area of 9) and extension electrodes [is] electrically connected to said casing

Said crystal blank has a free end in said second position.

Nippon further shows a pillow member (6) mounted on the casing, said free end being placed on said pillow (6).

Nippon doesn't show a hole portion defined in at least one principal surface thereof, or wire bonding.

It would have been obvious to one having ordinary skill in the art to employ the pillow of Nippon in the combined device of Morita et al. and Satoshi et al. at the time of either invention in order to allow the device to maintain a level crystal at opposite ends of the contained base, which also allows for mitigation of problems related to such

during storage. See the NOVELTY and USE sections especially in the Nippon document.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional prior art cited reads on aspects of the claimed invention: Takatsuchi et al. ('080) show a resonator with a hole portion, a fixed end, a free end, excitation and extension electrodes; Nippon ('387) shows a cushion element in their cantilevered resonator construction within a casing; Maruta et al. ('865), abstract only, show use of eutectic alloys; Satoshi ('160) shows a crystal oscillator with an excitation region, excitation and extension electrodes and use of an eutectic alloy; Morita et al. shown ('328) an AT-cut quartz crystal oscillator with a hole portion, excitation and extension electrodes within a casing, and a possible pillow member (adhesive 15), employed to prevent flapping; Watanabe et al. (954) show a crystal oscillator with a hole portion; Heinecke et al. (989) show a quartz crystal resonator with a hole portion, excitiation and extension electrodes within a casing; Sasaki shows ('688) in his figure 7B a resonator with a hole portion and excitation and extension electrodes; Fukuyo et al. ('617) teach use of a cushion member in their oscillator device; Doi et al. ('163) teach a crystal oscillator design comprising an AT cut with a fixed and free end, a hole portion in one surface, excitation and extension electrodes all within a casing; Toshinori et al. (919) teach use of eutectic solder in their resonator

device for the purpose of obtaining excellent shock resistance and productivity; Nippon ('398 and '156) teaches use of eutectic alloy for mounting a quartz crystal.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd

tmd

June 10, 2005

TOM DOUGHERTY
PRIMARY EXAMINER